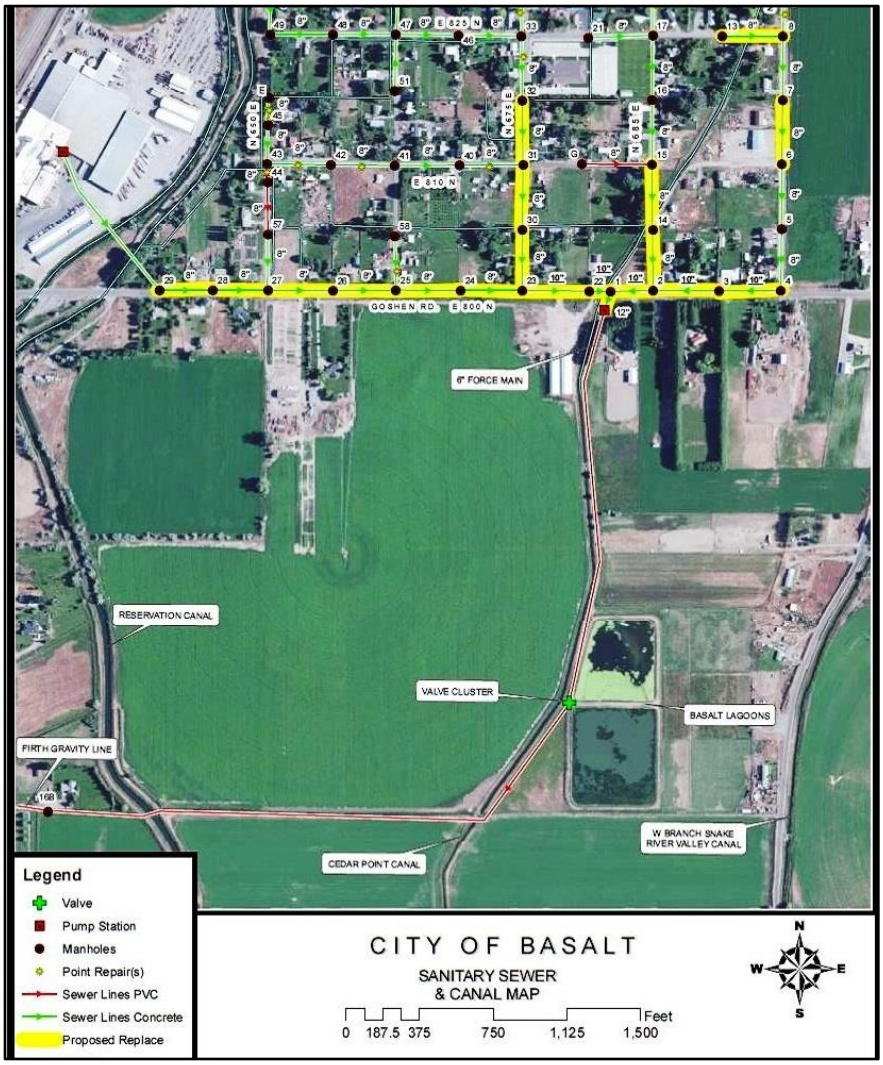
Clean Water State Revolving Fund FY17 Green Project Reserve

- Preliminary GPR -



City of Basalt FY17 Wastewater Project

SRF Loan #WW1702

(pop. 392)

$708,000

Preliminary Green Project Reserve Justification

Business Case GPR Documentation

1. RENOVATION OF GRAVITY WASTEWATER COLLECTION SYSTEM EXPERIENCING EXCESSIVE INFILTATION (Energy Efficiency). Business Case GPR per 3.5-4: *I/I correction projects that save energy from pumping, chemical usage and WWTP capacity and are cost effective* ($565,306).

2. INSTALL SCADA SYSTEM IN LIFT STATION(Energy Efficiency). Business Case GPR per 3.5-8: *SCADA systems can be justified based on substantial energy savings.* ($12,000).

1. Renovation of Gravity Wastewater Collection System[1]

Summary

- Renovation of the City's gravity wastewater collection system to reduce excessive infiltration. The system was installed in 1974.
- Estimated loan amount = $708,000
- Estimated energy efficient (green) portion of loan = x% ($xxxx)

Background

- A 2014 camera survey identified numerous failing pipe sections as well as 40 individual points requiring repair; an evaluation of flow rates indicates substantial infiltration.
- Rainfall and high groundwater levels occur annually in the spring and fall. During these 6 months the lift station pumps up to .23 MGD (= 48.3MG) resulting in 22 to 24 hour daily pump runtimes, and **higher chemical usage at the STP.** Average Daily Flow (ADF) during dry weather months is .014 MGD resulting in 1- 2 hour daily pump runtimes. So, total volume to be treated by a BPA = .23 - .014 = .22 MGD x 6mo x 30 da/mo = 45.4 MG.
- The project will replace 5,500 LF of 8" and 12" concrete sewer main, 40 individual point repairs, and 21 manholes.

Results

- The project will reduce infiltration flows by almost 75% (from .230 MGD to .057 MGD), and pump runtimes from 24 hours daily to 1 to 2 hours daily. Therefore 75% of the wet weather volume will not have to be pumped = .75 x 48.3 = 36.2 MG.

Analysis[2]

Cost Effectiveness

- To determine the overall cost effectiveness and energy savings of the selected alternative, it is compared to a Best Practicable Alternative (BPA). For I/I projects, the BPA consists of continued pumping of the existing wastewater flow (including infiltration) to the Firth collection system, followed by continued downstream treatment of the increased wastewater I/I volume.
- The BPA is more energy intensive. GPR-eligible costs are the power costs saved by the upgrade project + reduced chemical and treatment costs.

Lift Station Wet Well, Electrical Panel, and Valve Vault

Energy Savings

- Existing Flow: reducing system I/I by 75% results in a direct reduction in energy consumption by the existing lift station during the months of high infiltration levels, for the 40 year life of the project = (36.2/31) x $41,320 = **$48,284.**
- BPA: the selected alternative avoids pumping wastewater for 40 years from the Lift Station to the Firth WWTP. The 40-year O&M pumping costs = (45.4/31) x $937,460 = $1,372,925.

Conclusion

- Eliminating 75% of infiltration in the collection system is GPR-eligible since energy is saved from reduced lift station pumping costs (75% lower for the lift station), along with reduced treatment costs.
- **GPR Costs**: GPR-eligible energy savings = Power Savings from less pumping + reduced treatment costs = $48,284 + $xxxxxx = **$xxxxxx**
  ∴ GPR costs = **$685,954**
- **GPR Justification**: The prioritized replacement of gravity sewer lines by the City is GPR eligible by a Business Case per Section 3.5-4 (Energy Efficient): *Infiltration/Inflow (I/I) correction projects that save energy from pumping and reduced treatment costs and are cost effective.*

[1] City of Firth/Basalt Facility Planning Wastewater Study April 2015, Schiess Associates
[2] Power costs = $0.08/kWh

2. SCADA CONTROL TECHNOLOGY

Summary

- Energy efficiency results from the remote electronic sensing and control of the treatment plant.
- Estimated loan amount = $708,000
- Estimated energy efficiency (green) portion of loan ≅ 1.7% ($12,000) (installed costs)
- Estimated annual energy savings $11,800 per year.

Background / Results[3]

- The SCADA system was upgraded in this project to include the lift station which transfers sewage to the City of Firth wastewater collection system.

Energy Efficiency Improvements

- OPERATORS: Remote SCADA control saves labor and travel costs = 1 person thirty minutes each day of the year = $6,400 per year in labor costs; travel cost @ $0.51 per mile @ 2 miles = $400 per year = total saving of $6,800/yr.

Conclusion

- Total SCADA savings are around $11,800 per year in energy, labor, and travel costs = payback of 13 years. therefore SCADA system costs are GPR-eligible by 3.5-8.
- **GPR Costs:** SCADA = $12,000
- **GPR Justification:** SCADA system costs are GPR-eligible by a Business Case per 3.5-8[4]: *SCADA systems can be justified based on substantial energy savings.*

[3] City of Firth/Basalt Facility Planning Wastewater Study April 2015, Schiess Associates
[4] Attachment 2. April 21, 2011 EPA Guidance for Determining Project Eligibility.